IN THE CLAIMS

1. (Currently amended) A method for recovering data transmitted in a wireless communication system, comprising:

receiving a plurality of modulation symbols for a plurality of transmitted coded bits;

determining ~~deriving~~ a first plurality of soft decision symbols ~~*a priori* information~~ for a first subset of the transmitted coded bits based on the received plurality of modulation symbols and first extrinsic information ~~second *a priori* information~~ for the transmitted coded bits;

determining ~~decoding~~ the first extrinsic ~~*a priori*~~ information based on the first plurality of soft decision symbols ~~to derive the second *a priori* information~~;

repeating the determining a first plurality of soft decision symbols and the determining the first extrinsic information ~~deriving and decoding~~ a plurality of times; ~~and~~

determining decoded bits for the first subset of transmitted coded bits based ~~in part~~ on the first extrinsic ~~second *a priori*~~ information;

determining a second plurality of soft decision symbols for a second subset of the plurality of transmitted coded bits based on the received plurality of modulation symbols and second extrinsic information for the second subset of the plurality of transmitted coded bits;

determining the second extrinsic information based on the second plurality of soft decision symbols and wherein the second extrinsic information is independent of the first extrinsic information;

repeating the determining a second plurality of soft decision symbols and the determining the second extrinsic information a plurality of times; and

determining decoded bits for the second subset of the plurality of transmitted coded bits based on the second extrinsic information.

2. (Currently amended) The method of claim 1, further comprising:

deriving ~~soft-decision symbols~~ first *a priori* information for the first subset of the plurality of the transmitted coded bits based on the received modulation symbols and the first extrinsic ~~second *a priori*~~ information, and wherein the first plurality of soft decision symbols ~~*a priori* information~~ is ~~derived~~ determined based on the ~~soft-decision symbols~~ first *a priori* information and the first extrinsic ~~second *a priori*~~ information.

3. (Currently amended) The method of claim 1 ~~claim 2~~, wherein the soft-decision symbols are represented as log-likelihood ratios (LLRs).

4. (Currently amended) The method of claim 1 ~~claim 2~~, wherein the soft-decision symbols comprise channel information ~~and extrinsic information~~.

5. (Currently amended) The method of claim 1 ~~claim 2~~, wherein the soft-decision symbols comprise information for one or more spatial subchannels and one or more frequency subchannels used to transmit the plurality of modulation symbols.

6. (Currently Amended) The method of claim 1, further comprising:

deinterleaving the soft decision symbols ~~first *a priori* information~~, wherein the deinterleaved soft decision symbols ~~first *a priori* information~~ is decoded; and

interleaving the first extrinsic information ~~second *a priori* information~~, wherein the interleaved first extrinsic information ~~second *a priori* information~~ is used to derive the soft decision symbols ~~first *a priori* information~~.

7. (Original) The method of claim 1, wherein the wireless communication system is a multiple-input multiple-output (MIMO) system.

8. (Original) The method of claim 7, wherein the MIMO system implements orthogonal frequency division multiplexing (OFDM).

9. (Cancelled).

10. (Currently amended) The method of claim 1 ~~claim 9~~, further comprising:

recovering a first subset of the modulation symbols for a first ~~each~~ transmit antenna by nulling a second subset of the modulation symbols for a second ~~other~~ transmit antenna ~~antennas, and~~

~~wherein the soft-decision symbols for the coded bits transmitted from each transmit antenna are derived based on the recovered modulation symbols for the transmit antenna and the second *a priori* information for the transmit antenna~~.

11. (Currently amended) The method of claim 10, wherein the recovering the first subset of the modulation symbols for the first [[~~each~~]] transmit antenna includes

pre-multiplying the received modulation symbols with a plurality of nulling matrices to derive the first subset of the recovered modulation symbols for a ~~the~~ plurality of frequency subchannels of the [[first]]transmit antenna.

12. (Currently amended) The method of claim 1 ~~claim 9~~, further comprising: ~~for each transmit antenna except the last transmit antenna,~~

recovering the first subset of the modulation symbols for the first transmit antenna by nulling the modulation symbols for the second ~~other~~ transmit antenna ~~antennas~~ from the received ~~input~~ modulation symbols ~~for the transmit antenna~~, and

canceling interference due to the recovered modulation symbols from the received ~~input~~ modulation symbols, thereby producing interference-cancelled modulation symbols, and

recovering the second subset of the modulation symbols from the ~~wherein the input modulation symbols for the first transmit antenna are the received modulation symbols and the input modulation symbols for each subsequent transmit antenna are~~ the interference-cancelled modulation symbols ~~from the current transmit antenna~~.

13. (Currently amended) The method of claim 1 ~~claim 9~~, further comprising: ~~for each transmit antenna except the last transmit antenna,~~

deriving pre-decoding interference estimates based ~~in part~~ on the soft-decision symbols ~~for the transmit antenna~~; and

canceling the pre-decoding interference estimates from input modulation symbols ~~for the transmit antenna~~, and

wherein the input modulation symbols for ~~the~~ a first transmit antenna are the received modulation symbols and the input modulation symbols for each subsequent transmit antenna are the interference-cancelled modulation symbols from the current transmit antenna.

14. (Currently amended) The method of claim 1 ~~claim 9~~, further comprising:

deinterleaving the soft decision symbols ~~first *a priori* information~~, wherein the deinterleaved soft decision symbols ~~first *a priori* information~~ is decoded; and

interleaving the first extrinsic information ~~second *a priori* information~~, wherein the interleaved first extrinsic information ~~second *a priori*~~ is used to derive the soft-decision symbols.

15. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the soft-decision symbols are represented as log-likelihood ratios (LLRs).

16. (Original) The method of claim 15, wherein a dual-maxima approximation is used to derive the LLRs for the coded bits.

17. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the soft-decision symbols comprise channel information.

18. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the soft-decision symbol for each coded bit comprises extrinsic information extracted from other coded bits.

19. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the decoding is based on a parallel concatenated convolutional decoding scheme.

20. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the decoding is based on a serial concatenated convolutional decoding scheme.

21. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the decoding is based on a convolutional decoding scheme.

22. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the decoding is based on a block decoding scheme.

23. (Currently amended) The method of claim 1 ~~claim 9~~,, wherein the decoding is based on a concatenated convolutional decoding scheme, and wherein a dual-maxima approximation is used for evaluating log-likelihood ratios (LLRs) for the decoding.

24. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the decoding for each transmit antenna is based on a respective decoding scheme.

25. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the plurality of modulation symbols are derived based on a non-Gray modulation scheme.

26. (Currently amended) The method of claim 1 ~~claim 9~~, wherein the modulation symbols for each transmit antenna are derived based on a respective modulation scheme.

27. (Currently amended) A receiver unit in a wireless communication system, comprising:

a detector operative to receive a plurality of modulation symbols for a plurality of transmitted coded bits, derive soft-decision symbols for the coded bits based on the received modulation symbols and second *a priori* information for the coded bits, and derive first *a priori* information for the coded bits based on the soft-decision symbols and the second *a priori* information; ~~and~~

a first ~~at least one~~ decoder operative to decode a first subset of the first *a priori* information to derive a first subset of the second *a priori* information and to determine a first subset of decoded bits for a first subset of the transmitted coded bits based ~~in part~~ on the first subset of the second *a priori* information, and

wherein the first subset of the first *a priori* information is derived by the detector and decoded by the first ~~at least one~~ decoder a plurality of times prior to determining the first subset of the decoded bits; and

a second decoder operative to decode a second subset of the first *a priori* information to derive a second subset of the second *a priori* information and to determine a second subset of decoded bits for a second subset of the transmitted coded bits based on the second subset of the second *a priori* information, and

wherein the second subset of the first *a priori* information is derived by the detector and decoded by the second decoder a plurality of times prior to determining the second subset of the decoded bits, and

wherein the first subset of the first *a priori* information is independent from the second subset of the first *a priori* information.

28. (Currently amended) The receiver unit of claim 27, further comprising:

a deinterleaver operative to deinterleave the first *a priori* information, wherein the deinterleaved first *a priori* information is decoded by the ~~at least one~~ first decoder; and

an interleaver operative to interleave the second *a priori* information, wherein the interleaved second *a priori* is used by the detector to derive the soft-decision symbols.

29. (Original) The receiver unit of claim 27, wherein the soft-decision symbols represent log-likelihood ratios (LLRs) for the coded bits.

30. (Original) The receiver unit of claim 29, wherein the detector is operative to use a dual-maxima approximation to derive the LLRs for the coded bits.

31. (Original) The receiver unit of claim 27, wherein the detector is further operative to recover the modulation symbols for each transmit antenna by nulling the modulation symbols for other transmit antennas, and to derive the soft-decision symbols for the coded bits transmitted from each transmit antenna based on the recovered modulation symbols for the transmit antenna and the second *a priori* information.

32. (Original) The receiver unit of claim 31, wherein the detector is further operative to pre-multiply the received modulation symbols with a plurality of nulling matrices to derive the recovered modulation symbols for the plurality of frequency subchannels of each transmit antenna.

33. (Original) The receiver unit of claim 31, wherein the detector is further operative to cancel interference due to the recovered modulation symbols for each transmit antenna, and to recover the modulation symbols for each subsequent transmit antenna, except the last transmit antenna, based on the interference-cancelled modulation symbols.

34. (Original) The receiver unit of claim 27, wherein one decoder is provided for each independently coded data stream to be decoded by the receiver.

35. (Currently amended) The receiver unit of claim 27, wherein [[~~the~~]] at least one decoder is operative to perform concatenated convolutional decoding on the first *a priori* information.

36. (Currently amended) The receiver unit of claim 27, wherein [[~~the~~]] at least one decoder implements a maximum *a posteriori* (MAP) decoding algorithm.

37. (Original) The receiver unit of claim 27, further comprising:

a channel estimator operative to estimate one or more characteristics of a communication channel via which the plurality of modulation symbols are received; and

a transmitter unit operative to process and transmit channel state information indicative of the estimated channel characteristics.

38. (Original) The receiver unit of claim 37, wherein the channel state information is indicative of a particular coding and modulation scheme to be used for each transmit antenna.

39. (Original) The receiver unit of claim 37, wherein the channel state information is indicative of a particular coding and modulation scheme to be used for all transmit antennas.

40. (Original) The receiver unit of claim 27, wherein the wireless communication system is a multiple-input multiple-output (MIMO) system that implements orthogonal frequency division multiplexing (OFDM).

41. (Original) A terminal comprising the receiver unit of claim 27.

42. (Original) A base station comprising the receiver unit of claim 27.

43. (Original) An access point comprising the receiver unit of claim 27.

44. (Currently amended) A receiver apparatus in a wireless communication system, comprising:

means for receiving a plurality of modulation symbols for a plurality of coded bits transmitted via a plurality of frequency subchannels of a plurality of transmit antennas;

means for deriving soft-decision symbols for the coded bits based on the received modulation symbols and second *a priori* information for the coded bits;

means for deriving first *a priori* information for the coded bits based on the soft-decision symbols and the second *a priori* information;

first means for decoding a first subset of the first *a priori* information to derive a first subset of the second *a priori* information, wherein the first subset of the first *a priori* information is derived and decoded a plurality of times; ~~and~~

first means for determining a first subset of decoded bits for a first subset of the transmitted coded bits based in part on the second *a priori* information;

second means for decoding a second subset of the first *a priori* information to derive a second subset of the second *a priori* information, wherein the second subset of the first *a priori* information is derived and decoded a plurality of times; and

second means for determining a second subset of decoded bits for the second subset of the transmitted coded bits based in part on the second *a priori* information, and

wherein the first subset of the first *a priori* information is independent of the second subset of the first *a priori* information.

45. (Original) The receiver apparatus of claim 44, further comprising:

means for recovering the modulation symbols for each transmit antenna by nulling the modulation symbols for other transmit antennas, and

wherein the soft-decision symbols for the coded bits transmitted from each transmit antenna are derived based on the recovered modulation symbols for the transmit antenna and the second *a priori* information for the transmit antenna.

46. (Original) The receiver apparatus of claim 44, further comprising:

means for deinterleaving the first *a priori* information, wherein the deinterleaved first *a priori* information is decoded; and

means for interleaving the second *a priori* information, wherein the interleaved second *a priori* is used to derive the soft-decision symbols.

47 – 68. Cancelled